Version with markings to show changes made

In the claims:

Claim 1, 20, and 41 has been amended as follows:

1. (Four times amended) A method of making a multi-layer article, comprising:

epitaxially depositing a first material on a surface of a third material to form a deposited layer of the first material, the first material being a buffer material, the deposited layer of the first material having a surface with a crystallinity and a morphology;

chemically conditioning the surface of the deposited layer of the first material to form a conditioned surface having a crystallinity and a morphology, the crystallinity of the conditioned surface being substantially the same as the crystallinity of the surface of the deposited layer, and the morphology of the conditioned surface being different from the morphology of the deposited layer; and

disposing a layer of a second material on the conditioned surface.

~~20.~~ (Four times amended) A method of making a multi-layer article, comprising:

epitaxially depositing a first material on a surface of a third material to form a deposited layer of the first material, the first material being a buffer material, the deposited layer of the first material having a surface with a crystallinity and a morphology;

heating, at an oxygen gas pressure of less than about 700 Torr, the surface of the deposited layer of the first material to a temperature at least about 5°C above a temperature selected from the group consisting of a deposition temperature of the layer of the first material and a crystallization temperature of the layer of the first material to form a conditioned surface having a crystallinity and a morphology, the crystallinity of the conditioned surface being substantially the same as the crystallinity of the surface of the deposited layer, and the morphology of the conditioned surface being different from the morphology of the deposited layer; and

disposing a second material on the conditioned surface.

WHAT IS CLAIMED IS:

1. A method of making a multi-layer article, comprising:

chemically conditioning a surface of a layer of a first material to form a conditioned surface, the first material comprising a material selected from the group consisting of a buffer material and a superconductor material; and

disposing a layer of a second material on the conditioned surface.

2. The method of claim 1, wherein the first material comprises a superconductor material.

3. The method of claim 1, wherein the first material comprises a buffer material.

4. The method of claim 1, wherein the conditioned surface is biaxially textured.

5. The method of claim 1, wherein the second material comprises a material selected from the group consisting of a superconductor material and a precursor of a superconductor material.

6. The method of claim 1, wherein the second material comprises a buffer material.

7. The method of claim 1, wherein the second material comprises a cap material.

8. The method of claim 1, wherein the layer of the second material is disposed on the conditioned surface prior to annealing the conditioned surface.

Version with markings to show changes made

In the claims:

Claims 2, 3, 21, 22, 42 and 43 were cancelled.

The claims were amended as follows.

~~41.~~ (Twice Amended) A method of making a multi-layer article, comprising:

depositing a first material on a surface of a third material to form a deposited layer of the first material, the first material being [selected from the group consisting of] a buffer material [and a superconductor material], the deposited layer of the first material having a surface with a crystallinity and a morphology;

chemically conditioning [a] the surface of the deposited layer of the first material to form a conditioned surface having a crystallinity and a morphology, the crystallinity of the conditioned surface being substantially the same as the crystallinity of the surface of the deposited layer, and the morphology of the conditioned surface being different from the morphology of the deposited layer; and

disposing a layer of a second material on the conditioned surface.

7 ~~9.~~ (Once Amended) The method of claim 1, further comprising disposing a layer of a [third] fourth material on a surface of the layer of the second material.

8 ~~10.~~ (Once Amended) The method of claim 9, further comprising, prior to disposing the layer of the [third] fourth material on the surface of the layer of the second material, conditioning the surface of the layer of the second material.

17 ~~20.~~ (Twice Amended) A method of making a multi-layer article, comprising:

depositing a first material on a surface of a third material to form a deposited layer of the first material, the first material being [selected from the group consisting of] a buffer material [and a superconductor material], the deposited layer of the first material having a surface with a crystallinity and a morphology;

9. The method of claim 1, further comprising disposing a layer of a third material on a surface of the layer of the second material.

10. The method of claim 9, further comprising, prior to disposing the layer of the third material on the surface of the layer of the second material, conditioning the surface of the layer of the second material.

11. The method of claim 10, wherein conditioning the surface of the layer of the second material includes chemically conditioning the surface of the layer of the second material.

12. The method of claim 10, wherein conditioning the surface of the layer of the second material includes thermally conditioning the surface of the layer of the second material.

13. The method of claim 10, wherein, subsequent to conditioning the surface of the layer of the second material, the surface of the second material is biaxially textured.

14. The method of claim 1, further comprising thermally conditioning the conditioned surface.

15. The method of claim 1, further comprising, prior to chemically conditioning the surface of the layer of the first material, disposing the layer of the first material on a surface of a layer of a third material.

Version with markings to show changes made

In the claims

The Claims were amended as follows.

--1. (Once Amended) A method of making a multi-layer article, comprising:

depositing a first material on a surface of a third material to form a deposited layer of the first material, the first material being selected from the group consisting of a buffer material and a superconductor material;

chemically conditioning a surface of [a] the deposited layer of [a] the first material to form a conditioned surface[, the first material comprising a material selected from the group consisting of a buffer material and a superconductor material]; and

disposing a layer of a second material on the conditioned surface.

13

~~16.~~ (Once Amended) The method of claim [15] 1, wherein the third material comprises a substrate material.

14

~~17.~~ (Once Amended) The method of claim [15] 1, wherein the surface of the layer of the third material is biaxially textured.

15

~~18.~~ (Once Amended) The method of claim [15] 1, wherein the third material comprises a single crystal material.

20. (Once Amended) A method of making a multi-layer article, comprising:

depositing a first material on a surface of a third material to form a deposited layer of the first material, the first material being selected from the group consisting of a buffer material and a superconductor material;

heating, at an oxygen gas pressure of less than about 700 Torr, a surface of [a] the deposited layer of [a] the first material to a temperature at least about 5°C above a temperature

16. The method of claim 15, wherein the third material comprises a substrate material.

17. The method of claim 15, wherein the surface of the layer of the third material is biaxially textured.

18. The method of claim 15, wherein the third material comprises a single crystal material.

19. The method of claim 1, wherein the second material has a critical current density of at least about $1x10^6$ Amperes per square centimeter.

20. A method of making a multi-layer article, comprising:

heating, at an oxygen gas pressure of less than about 700 Torr, a surface of a layer of a first material to a temperature at least about 5°C above a temperature selected from the group consisting of a deposition temperature of the layer of the first material and a crystallization temperature of the layer of the first material to form a conditioned surface, the first material comprising a material selected from the group consisting of a buffer material and a superconductor material; and

disposing a second material layer on the conditioned surface.

21. The method of claim 20, wherein the first material comprises a buffer material.

22. The method of claim 20, wherein the first material comprises a superconductor material.

18

23. The method of claim 20, wherein the conditioned surface is a biaxially textured surface.

19

24. The method of claim 20, wherein the second material comprises a material selected from the group consisting of a superconductor and a precursor of a superconductor.

20

25. The method of claim 20, wherein the second material comprises a buffer material.

21

26. The method of claim 20, wherein the second material comprises a cap material.

22

27. The method of claim 20, wherein the second material layer has a biaxially textured surface.

23

28. The method of claim 20, wherein the temperature is from about 10°C to about 500°C above the temperature selected from the group consisting of a deposition temperature of the first layer and a crystallization temperature of the first layer.

24

29. The method of claim 20, wherein the temperature is from about 75°C to about 300°C above the temperature selected from the group consisting of a deposition temperature of the first layer and a crystallization temperature of the first layer.

25

30. The method of claim 20, wherein the oxygen gas pressure is less than about 100 Torr .

26

31. The method of claim 20, wherein the oxygen gas pressure is less than about 1 Torr.

32. The method of claim 20, wherein the surface of the layer of the first material is heated in an environment comprised primarily of hydrogen and inert gas.

33. The method of claim 20, wherein the surface of the layer of the first material is heated in an environment comprised primarily of inert gas.

34. The method of claim 20, further comprising, prior to heating the surface of the layer of the first material, disposing the layer of the first material on a surface of a layer of a third material.

35. The method of claim 34, wherein the third material comprises a substrate material.

36. The method of claim 34, wherein the third material comprises a material selected from the group consisting of nickel and silver.

37. The method of claim 34, wherein the surface of the layer of the third material is biaxially textured.

38. The method of claim 34, wherein the third material comprises a single crystal material.

39. The method of claim 20, further comprising chemically conditioning the conditioned surface.

selected from the group consisting of a deposition temperature of the layer of the first material and a crystallization temperature of the layer of the first material to form a conditioned surface[, the first material comprising a material selected from the group consisting of a buffer material and a superconductor material]; and

disposing a second material layer on the conditioned surface.

29

~~35.~~ (Once Amended) The method of claim [34] 20, wherein the third material comprises a substrate material.

30

~~36.~~ (Once Amended) The method of claim [34] 20, wherein the third material comprises a material selected from the group consisting of nickel and silver.

31

~~37.~~ (Once Amended) The method of claim [34] 20, wherein the surface of the layer of the third material is biaxially textured.

32

~~38.~~ (Once Amended) The method of claim [34] 20, wherein the third material comprises a single crystal material.

41. (Once Amended) A method of making a multi-layer article, comprising:

depositing a first material on a surface of a third material to form a deposited layer of the first material, the first material being selected from the group consisting of a buffer material and a superconductor material;

heating a surface of [a] the deposited layer of [a] the first material to a temperature at least about 5°C above a temperature selected from the group consisting of a deposition temperature of the layer of the first material and a crystallization temperature of the layer of the first material to form a conditioned surface, [the first material comprising a material selected from the group consisting of a buffer material and a superconductor material,] the first material being disposed on a surface of a polycrystalline material; and

disposing a second material layer on the conditioned surface.

34

~~40~~. The method of claim 20, wherein the second material has a critical current density of at least about $1x10^6$ Amperes per square centimeter.

41. A method of making a multi-layer article, comprising:

heating a surface of a layer of a first material to a temperature at least about 5°C above a temperature selected from the group consisting of a deposition temperature of the layer of the first material and a crystallization temperature of the layer of the first material to form a conditioned surface, the first material comprising a material selected from the group consisting of a buffer material and a superconductor material, the first material being disposed on a surface of a polycrystalline material; and

disposing a second material layer on the conditioned surface.

42. The method of claim 41, wherein the first material comprises a buffer material.

43. The method of claim 41, wherein the first material comprises a superconductor material.

36

~~44~~. The method of claim 41, wherein the conditioned surface is biaxially textured.

37

~~45~~. The method of claim 41, wherein the polycrystalline material comprises a substrate material.

38

~~46~~. The method of claim 41, wherein the polycrystalline material comprises a textured material.

17 (cont.)

epitaxially depositing a first material on a surface of a third material to form a deposited layer of the first material, the first material being a buffer material, the deposited layer of the first material having a surface with a crystallinity and a morphology;

heating, at an oxygen gas pressure of less than about 700 Torr, the surface of the deposited layer of the first material to a temperature at least about 5°C above a temperature selected from the group consisting of a deposition temperature of the layer of the first material and a crystallization temperature of the layer of the first material to form a conditioned surface having a crystallinity and a morphology, the crystallinity of the conditioned surface being substantially the same as the crystallinity of the surface of the deposited layer, and the morphology of the conditioned surface being different from the morphology of the deposited layer; and

disposing a second material on the conditioned surface.

35-44. (Four times amended) A method of making a multi-layer article, comprising:

epitaxially depositing a first material on a surface of a third material to form a deposited layer of the first material, the first material being a buffer material, the deposited layer of the first material having a surface with a crystallinity and a morphology;

heating the surface of the deposited layer of the first material to a temperature at least about 5°C above a temperature selected from the group consisting of a deposition temperature of the layer of the first material and a crystallization temperature of the layer of the first material to form a conditioned surface having a crystallinity and a morphology, the crystallinity of the conditioned surface being substantially the same as the crystallinity of the surface of the deposited layer, and the morphology of the conditioned surface being different from the morphology of the deposited layer, the first material being disposed on a surface of a polycrystalline material; and

disposing a second material layer on the conditioned surface.

39

~~47~~. The method of claim ~~46~~, wherein the textured material has a biaxially textured surface.

40

~~48~~. The method of claim ~~41~~, wherein the second material comprises a material selected from the group consisting of a superconductor and a precursor of a superconductor.

41

~~49~~. The method of claim ~~41~~, wherein the second material comprises a buffer material.

42

~~50~~. The method of claim ~~41~~, wherein the second material layer has a biaxially textured surface.

43

~~51~~. The method of claim ~~41~~, wherein the temperature is from about 10°C to about 500°C above the temperature selected from the group consisting of a deposition temperature of the first layer and a crystallization temperature of the first layer.

44

~~52~~. The method of claim ~~41~~, wherein the temperature is from about 75°C to about 300°C above the temperature selected from the group consisting of a deposition temperature of the first layer and a crystallization temperature of the first layer.

45

~~53~~. The method of claim ~~41~~, further comprising chemically conditioning the conditioned surface.

46

~~54~~. The method of claim ~~41~~, wherein the second material has a critical current density of at least about $1x10^6$ Amperes per square centimeter.

47

55. The method of claim 20, wherein the surface of the layer of the first material is heated in an environment comprising water vapor.

56. The method of claim 20, wherein of the environment further comprises hydrogen and an inert gas.

49

57. The method of claim 41, wherein the surface of the layer of the first material is heated in an environment comprising water vapor.

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58. The method of claim 57, wherein of the environment further comprises hydrogen and an inert gas.

~~56~~ 48. (Once Amended) The method of claim [20] 55, wherein [of] the environment further comprises hydrogen and an inert gas.--